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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/992,540	11/06/2001	Naoki Takizawa	M1971-105	4425

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EXAMINER

KIM, PAUL D

ART UNIT	PAPER NUMBER
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3729

DATE MAILED: 04/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/992,540

Applicant(s)

TAKIZAWA ET AL.

Examiner

Paul D Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,9,11,13 and 15 is/are pending in the application.
- 4a) Of the above claim(s) 16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,9,11,13 and 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4, 6.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This office action is a response to the restriction requirement filed on 3/1/2004.

Response to the Restriction Requirement

1. Applicant's election without traverse of Group I, claims 1-7, 9, 11, 13 and 15, on 3/1/2004 is acknowledged.

However, applicant traverses that the election of species is improper since the amended claims 11 and 15 depend on claim 1. Upon further consideration, examiner agrees with applicant's counsel so that examiner withdraws the election of species in Paper No. 7.

2. Claim 16 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse on 3/1/2004.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: --A METHOD FOR MANUFACTURING A MAGNETIC RECORDING MEDIUM--.

Claim Objections

4. Claims 1-7, 11, 13 and 15 objected to because of the following informalities:

Re. claim 1: The phrase "a magnetic layer" as recited in line 9 should be --said magnetic layer--.

Re. claims 2-7, 11 and 15: The phrase "A method" as recited in line 1 should be --The method--.

Re. claim 11: Claim 11 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The phrase "selecting a non-magnetic substrate" as recited in line 3 is objected because the non-magnetic substrate is already indicated in line 3 of claim 1.

Re. claim 13: The phrase "a non-magnetic substrate" as recited in line 4 should be --said non-magnetic substrate--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 4 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4 and 15 recite the limitation "said non-magnetic grain boundaries" in line 2 of claim 4 and lines 13-14 of claim 15. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 3, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanbe et al. (US PAT. 6,403,240) in view of Inomata et al. (US PAT. 6,069,820) and Takahashi et al. (US PAT. 6,482,329).

Kanbe et al. teach a process of making a magnetic recording medium comprising steps of: laminating a non-magnetic layer (21) on a non-magnetic substrate (20) by sputtering; laminating a non-magnetic intermediate layer (22) on the non-magnetic layer (21) by sputtering; laminating a magnetic layer (23) on the non-magnetic intermediate layer by sputtering; laminating a protective layer (24) on the magnetic layer; and laminating a liquid lubricant layer (25) on the protective layer as shown in Fig. 6 (see also col. 10, lines 3-19).

Also, as per claim 3, Kanbe et al. teach that a thickness of the non-magnetic intermediate layer is about 30 nm. It would also be an obvious matter of design choice to modify a thickness of the non-magnetic intermediate layer as recited in the claimed

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invention because Applicant has not disclosed that the certain thickness as recited in the claimed invention provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with Kanbe et al. Therefore, it would be an obvious matter of design choice to modify the thickness of the non-magnetic intermediate layer of Kanbe et al. to obtain the invention as specified in claim 3.

As per claim 5 the non-magnetic layer is made of chromium (Cr).

As per claim 6 Kanbe et al. teach that the non-magnetic substrate is made of soda-lime glass.

However, Kanbe et al. fail to teach that the lamination of the magnetic layer including at least ferromagnetic grains and grain boundaries surrounding said grains. Inomata et al. teach a process of making a magnetic device including the granular ferromagnetic layer as a magnetic layer comprises a plurality of ferromagnetic grains scattered in a nonmagnetic material so that the granular layer has a finite coercive force and has ferromagnetism rather than paramagnetism (see also col. 18, lines 39-62). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a magnetic layer of Kanbe et al. by the granular ferromagnetic layer including a plurality of ferromagnetic grains scattered in a nonmagnetic material as taught by Inomata et al. in order to have a finite coercive force and ferromagnetism.

Also, Kanbe et al., modified by Inomata et al., fail to teach a process of the sputtering in an atmosphere having a partial pressure of H_2O of 2×10^{-10} Torr or below.

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Takahashi et al. teach a process of sputtering to form a non-magnetic layer and a ferromagnetic layer in an atmosphere having a partial pressure of H_2O of 2×10^{-9} Torr or below in order to remove impurity substances onto the surface of the substrate (see also col. 2, lines 10-30). Therefore, it would also have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a sputtering process of Kanbe et al., modified by Inomata et al., by sputtering in an atmosphere having a partial pressure of H_2O of 2×10^{-9} Torr or below as taught by Takahashi et al. in order to remove impurity substances onto the surface of the substrate. At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to apply a sputtering process having a partial pressure of H_2O of 2×10^{-10} Torr or below as recited in the claimed invention and it would have expected Applicant's invention to perform equally well with Takahashi et al. because the sputtering condition as recited in the claimed invention would perform equally well such as removing impurity substances and cleaning to the surface of the substrate in Takahashi et al. Therefore, it would have been an obvious matter of design choice to modify the sputtering condition of Takahashi et al. to obtain the invention as specified in claim 1.

9. Claims 1, 3, 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai et al. (US PAT. 6,383,404) in view of Takahashi et al.

Sakai et al. teach a process of making a magnetic recording medium comprising steps of: laminating a non-magnetic layer (2) on a non-magnetic substrate (1) by

sputtering; laminating a non-magnetic intermediate layer (3) on the non-magnetic layer by sputtering; laminating a magnetic layer (4) on the non-magnetic intermediate layer by sputtering; laminating a protective layer (5) on the magnetic layer, wherein (**as per claim 4**) the magnetic layer may be granular having such a structure that magnetic particles, such as, Fe, Co, FeCo, and CoNiPt, are dispersed in a non-magnetic film consisting of material, such as, ferrite based material, iron-rare earth-based material (col. 14, lines 25-30); and laminating a liquid lubricant layer (6) on the protective layer as shown in Fig. 4 (see also col. 13, line 33 to col. 14, line 53).

However, Sakai et al. fail to teach a process of the sputtering in an atmosphere having a partial pressure of H_2O of 2×10^{-10} Torr or below. Takahashi et al. teach a process of sputtering to form a non-magnetic layer and a ferromagnetic layer in an atmosphere having a partial pressure of H_2O of 2×10^{-9} Torr or below in order to remove impurity substances onto the surface of the substrate (see also col. 2, lines 10-30). Therefore, it would also have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a sputtering process of Sakai et al. by sputtering in an atmosphere having a partial pressure of H_2O of 2×10^{-9} Torr or below as taught by Takahashi et al. in order to remove impurity substances onto the surface of the substrate. At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to apply a sputtering process having a partial pressure of H_2O of 2×10^{-10} Torr or below as recited in the claimed invention and it would have expected Applicant's invention to perform equally well with Takahashi et al. because the sputtering condition as recited in the claimed

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invention would perform equally well such as removing impurity substances and cleaning to the surface of the substrate in Takahashi et al. Therefore, it would have been an obvious matter of design choice to modify the sputtering condition of Takahashi et al. to obtain the invention as specified in claim 1.

Also, as per claim 3, Sakai et al. teach that a thickness of the non-magnetic intermediate layer is about 25 nm. It would also be an obvious matter of design choice to modify a thickness of the non-magnetic intermediate layer as recited in the claimed invention because Applicant has not disclosed that the certain thickness as recited in the claimed invention provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with Sakai et al. Therefore, it would be an obvious matter of design choice to modify the thickness of the non-magnetic intermediate layer of Sakai et al. to obtain the invention as specified in claim 3.

As per claim 6 Sakai et al. teach that the non-magnetic substrate is made of glass.

10. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai et al. in view of Takahashi et al., and further in view of Furusawa et al. (JP 63317922 A).

Sakai et al., modified by Takahashi et al., teach all of the limitations as set forth above including the non-magnetic intermediate layer made of CrMo. However, Sakai et al., modified by Takahashi et al., do not teach the non-magnetic intermediate layer having a hexagonal close-packed crystal structure. Furusawa et al. teach a process of making a magnetic recording medium including the non-magnetic intermediate layer

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made of Cr and/or Mo having a hexagonal close-packed crystal structure in order to prevent deterioration in the quality of the soft magnetic layer. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the non-magnetic intermediate layer of Sakai et al., modified by Takahashi et al., by the non-magnetic intermediate layer made of Cr and/or Mo having a hexagonal close-packed crystal structure as taught by Furusawa et al. in order to prevent deterioration in the quality of the soft magnetic layer.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai et al. in view of Takahashi et al., and further in view of Tokuoka et al. (JP 07057237 A).

Sakai et al., modified by Takahashi et al., teach all of the limitations as set forth above except laminating processes without heating. Tokuoka et al. teach a process of making a magnetic recording medium including laminating process of non-magnetic layer and magnetic layer without heating the substrate in order to optimize the laminating steps. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the laminating processes of Sakai et al., modified by Takahashi et al., by laminating the layers without heat as taught by Tokuoka et al. in order to optimize the laminating steps.

12. Claims 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai et al. in view of Takahashi et al., and further in view of Furusawa et al.

Sakai et al. teach a process of making a magnetic recording medium comprising steps of: laminating a non-magnetic layer (2) on a non-magnetic substrate (1) by sputtering; laminating a non-magnetic intermediate layer (3) on the non-magnetic layer

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by sputtering; laminating a magnetic layer (4) on the non-magnetic intermediate layer by sputtering; laminating a protective layer (5) on the magnetic layer, wherein the magnetic layer may be granular having such a structure that magnetic particles, such as, Fe, Co, FeCo, and CoNiPt, are dispersed in a non-magnetic film consisting of material, such as, ferrite based material, iron-rare earth-based material (col. 14, lines 25-30); and laminating a liquid lubricant layer (6) on the protective layer as shown in Fig. 4 (see also col. 13, line 33 to col. 14, line 53).

However, Sakai et al. fail to teach a process of the sputtering in an atmosphere having a partial pressure of H_2O of 2×10^{-10} Torr or below. Takahashi et al. teach a process of sputtering to form a non-magnetic layer and a ferromagnetic layer in an atmosphere having a partial pressure of H_2O of 2×10^{-9} Torr or below in order to remove impurity substances onto the surface of the substrate (see also col. 2, lines 10-30). Therefore, it would also have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a sputtering process of Sakai et al. by sputtering in an atmosphere having a partial pressure of H_2O of 2×10^{-9} Torr or below as taught by Takahashi et al. in order to remove impurity substances onto the surface of the substrate. At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to apply a sputtering process having a partial pressure of H_2O of 2×10^{-10} Torr or below as recited in the claimed invention and it would have expected Applicant's invention to perform equally well with Takahashi et al. because the sputtering condition as recited in the claimed invention would perform equally well such as removing impurity substances and

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cleaning to the surface of the substrate in Takahashi et al. Therefore, it would have been an obvious matter of design choice to modify the sputtering condition of Takahashi et al. to obtain the invention as specified in claim 9.

Also, Sakai et al. teach that a thickness of the non-magnetic intermediate layer is about 25 nm. It would also be an obvious matter of design choice to modify a thickness of the non-magnetic intermediate layer as recited in the claimed invention because Applicant has not disclosed that the certain thickness as recited in the claimed invention provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with Sakai et al. Therefore, it would be an obvious matter of design choice to modify the thickness of the non-magnetic intermediate layer of Sakai et al. to obtain the invention as specified in claim 9.

Sakai et al., modified by Takahashi et al., teach all of the limitations as set forth above including the non-magnetic intermediate layer made of CrMo. However, Sakai et al., modified by Takahashi et al., do not teach the non-magnetic intermediate layer having a hexagonal close-packed crystal structure. Furusawa et al. teach a process of making a magnetic recording medium including the non-magnetic intermediate layer made of Cr and/or Mo having a hexagonal close-packed crystal structure in order to prevent deterioration in the quality of the soft magnetic layer. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the non-magnetic intermediate layer of Sakai et al., modified by Takahashi et al., by the non-magnetic intermediate layer made of Cr and/or Mo having a hexagonal

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close-packed crystal structure as taught by Furusawa et al. in order to prevent deterioration in the quality of the soft magnetic layer.

13. Claims 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai et al. in view of Takahashi et al., and further in view of Furusawa et al. and Tokuoka et al.

Sakai et al., modified by Takahashi et al., teach all of the limitations as set forth above including the non-magnetic intermediate layer made of CrMo. However, Sakai et al., modified by Takahashi et al., do not teach the non-magnetic intermediate layer having a hexagonal close-packed crystal structure. Furusawa et al. teach a process of making a magnetic recording medium including the non-magnetic intermediate layer made of Cr and/or Mo having a hexagonal close-packed crystal structure in order to prevent deterioration in the quality of the soft magnetic layer. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the non-magnetic intermediate layer of Sakai et al., modified by Takahashi et al., by the non-magnetic intermediate layer made of Cr and/or Mo having a hexagonal close-packed crystal structure as taught by Furusawa et al. in order to prevent deterioration in the quality of the soft magnetic layer.

Sakai et al., modified by Takahashi et al., teach all of the limitations as set forth above except laminating processes without heating. Tokuoka et al. teach a process of making a magnetic recording medium including laminating process of non-magnetic layer and magnetic layer without heating the substrate in order to optimize the laminating steps. Therefore, it would have been obvious at the time the invention was

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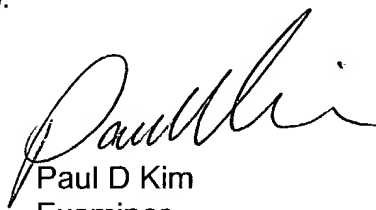
made to a person having ordinary skill in the art to modify the laminating processes of Sakai et al., modified by Takahashi et al., by laminating the layers without heat as taught by Tokuoka et al. in order to optimize the laminating steps.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul D Kim whose telephone number is 703-308-8356. The examiner can normally be reached on Tuesday-Friday between 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Paul D Kim
Examiner
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